Limitations of Trunk Blockage Reports as a Parity Measure. In the *Ameritech Michigan Order* the Commission asked for more detailed information on the extent that Ameritech re-routes calls for CLECs versus its own retail traffic. Ameritech believes that incorporation of re-routing information into the trunk blockage reports is an essential requirement, if they are to be developed into a parity measure. It appears feasible to reflect re-routing information in the blockage reports, but the actual impact of these factors needs further analysis before any precise methods can be proposed. Even with these adjustments, however, the content of the trunk blockage reports would still not tell the reader the actual level of traffic affected.

In paragraph 254 of its *Ameritech Michigan Order*, the Commission recognized the deficiency of trunk blockage reports as a measure of parity since they do not reflect the number of trunks affected, or the call volumes affected. The Commission thus recommended that future trunk blockage reports reflect data on actual trunk and call blockage, including the size of trunk groups and percentage of trunks actually blocked. The NPRM likewise also asks about the feasibility of providing this information. The answer is that incumbent LECs could report the size of trunk groups being blocked, but there does not appear to be any reasonable way to precisely equate size of trunk groups to the actual level of traffic that may be affected. Although the level of traffic being blocked can be estimated based upon the size of the trunk group involved, this approximation would still not be as accurate as tracking the actual calls involved.

If trunk blockage reports are to be used as a parity measure, they must also be modified to exclude any blockage that was not caused by the incumbent LEC or its network -- i.e.,

blockage caused by congestion or facilities problems within the CLEC's network, or because the CLEC could not or would not provide the ports necessary for the incumbent LEC to install additional trunks, or because the CLEC has sent a large volume of unforecasted and unanticipated traffic. Again, such modifications are feasible and should be permitted.

Even with such improvements, however, trunk blockage is still only a second-best solution. Trunk blockage reports are just not designed to measure parity of overall network performance. They are instead designed as a tool for network engineers to determine if certain facilities are functioning consistent with their design criteria (and specifically, the average expected blocking rate). That is to say, the trunk blockage reports help identify where corrective action may be needed, as well as identify trends and gauge whether in fact appropriate action was taken (i.e. to manage the performance of people doing the work.) The industry has not developed any techniques for assessing parity among CLECs and incumbent LECs. Indeed, there is no specific definition of parity in this context.

Also, trunk blockage reports focus only on the busy hour. However, the busy hour of any individual common trunk group may not coincide with the busy hour of each carrier whose traffic is commingled on that trunk group. Therefore, calls being blocked in hours outside of the trunk group busy hour may not be reflected in the blockage report, and a carrier that sends its traffic during hours other than the busy hour may not be experiencing blockage even though the facility blocks during the busy hour.

It is thus clear that trunk group blockage reports cannot include or properly reflect and compare all of the features discussed in the *Ameritech Michigan Order* or in the NPRM.

Although trunk blockage reports could be modified to reflect successfully re-routed calls, and blockage not caused by the incumbent LEC, they still do not reflect the actual level of CLEC or incumbent LEC calls not being completed.

Call Completion Reports As An Alternative To Trunk Blockage Reports. The Commission seeks comment on whether incumbent LECs should measure call completion rates. NPRM, ¶ 101. The Commission asks parties to address the benefits of using call completion rates in addition to, or instead of trunk blockage, and the costs and burdens of developing this measure. Ameritech believes that call completion reports can be developed that are superior to trunk blockage reports as a performance measure, and that incumbent LECs should have the option of providing call blockage reports in lieu of reporting trunk blockage. Ameritech strongly supports the availability of call completion reports as an alternative to trunk blockage reports, because they reflect all the features the Commission has requested in both the *Ameritech Michigan Order* and in the NPRM and because they provide a more complete measure of network performance and parity. Ameritech also recommends that CLECs be required to provide trunk blockage or call completion data as well.

In fact, the use of call completion reports eliminates the need to report on other interconnection performance measures, such as repair speed, since they are already reflected in the trunk or call blockage data. For example, if an incumbent LEC is slow in repairing facilities that are blocking, then that delay will be reflected in continued excessive call blockage. In fact, call blockage is a more accurate indication of parity, since it only reflects instances where the delay in repair was service affecting. Therefore, it would be redundant to report both call

blocking and repair performance. As a result, interconnection should be removed from Appendix A7, Percent of Trouble in 30 Days for New Orders; Appendix A10(1) Average Time to Restore; Appendix A10(2) Frequency of Trouble in 30-day Period; Appendix A10(3) Frequency of Repeat Troubles in a 30-day Period; and Appendix A10(4) Percent of Customer Troubles Resolved Within Established Time.

Call completion rates properly reflect the actual volume of calls that are being completed for both interconnection facilities and retail interoffice facilities. Thus, in contrast to trunk blockage, call blockage not only depicts that blockage may be occurring, but also reflects the actual volume and source of traffic that is affected. The call completion rate also automatically reflects calls that are re-routed and successfully completed over other facilities. Further, call completion reports can measure all traffic of all carriers during all hours of the day, not just the average busy hour of the trunks involved. Call completion rates are defined as a percentage and are calculated by dividing total call attempts minus blocked calls plus successful reroutes divided by total call attempts times 100%. Call completion is measured on final trunk groups; that is, trunk groups that are not designed to automatically overflow to other trunk groups when trunk group blockage occurs.

Call completion rates, like trunk blockage rates, should be adjusted to exclude blockage that results from actions or failures to act on the part of the CLEC. Call completion can be measured and reported separately for each CLEC, and for CLECs in the aggregate. New CLECs should be excluded from overall measures during an initial six month period when they are being established, but should be reported separately. This is necessary so that call completion results

are not biased by results for carriers that have not yet established their networks or ascertained penetration levels and demand patterns. All CLEC final trunk groups are measured and compared to a statistically valid sample of Ameritech retail final trunk groups. Ameritech is now generating a call completion report that meets the above specifications and has attached a sample as Appendix C.

Performance Parity. Based on the above discussion, Ameritech submits that call completion can properly serve as a true measure of parity in interconnection performance. Moreover, Ameritech proposes the use of a new parity test, based on call completion data, along the lines laid out in the attached White Paper by Drs. Pack, Fredericks, and Gordon (all of whom are leading authorities in the nation on network engineering).

This White Paper, which is attached as Appendix D hereto, addresses the technical aspects of measuring the quality and parity of network services. It demonstrates that call completion is a superior measure of network service quality. It also discusses the need to adjust raw call or trunk group blockage data to reflect the impact of network architectures and of traffic characteristics that affect network performance and are thus relevant when assessing performance. These traffic characteristics include volume, traffic volatility, deviation from forecasts, and any blockage caused by the CLEC. The paper also introduces a specific parity measure that includes a set of thresholds to trigger an analysis as to whether or not parity is being achieved based upon a difference in the levels of blockage experienced by CLECs and incumbent LECs. Finally, the paper discusses the factors that should be considered in

determining whether or not a particular failure to meet a threshold demonstrates that parity objectives may not have been met.

The paper reaches four conclusions. First, the paper concludes that trunk blockage is a valuable engineering tool and should continue to be used (by both incumbent LECs and CLECs) to identify facilities that may require augmentation or modification. Call completion reports, however, are superior to trunk blockage as a network performance measure , because they automatically reflect the actual level of traffic being completed.

Second, the paper concludes that raw trunk blockage or call completion data must be adjusted before they can be used in a meaningful way to gauge the quality or parity of network service. Some of these adjustments relate to the network architecture, traffic characteristics, and factors such as the number of interconnection points chosen by the CLEC, and the volatility and peakedness of the traffic.

Third, once the data has been adjusted, the resulting trunk or call blockage data needs to be tested, relative to a statistical threshold, to determine if there is a significant difference in performance that may indicate a lack of parity. It is important that the threshold be set at a statistically valid and substantively significant variation in performance. In this respect, the paper proposes the use of thresholds rather than average service objectives, because any average service objective would, by definition, be exceeded around half the time. The use of a threshold asks the more relevant question of what deviation is significant.

Fourth, the paper cautions that exceeding a threshold does not necessarily establish disparity. Rather, it simply triggers the need for further analysis, to determine the cause of the

apparent differences in performance. It is important to hold the incumbent LEC responsible only for factors that are within its control. For these reasons, whenever a threshold is exceeded for a relevant period, the incumbent LEC should report additional information as to whether or not a true parity issue exists. Generally, the persistence, significance, and cause of the blockage, along with the steps taken to remedy it, are all relevant to an analysis of performance.

b. Collocation

General Comments. The Commission proposes that incumbent LECs measure the "Average Time to Respond to a Collocation Request" based upon the date and time each request is "completed" compared to the date and time it was "submitted." NPRM, ¶ 103 & App. A, § VI.B.1. The Commission also proposes that incumbent LECs report the "Average Time to Provide a Collocation Arrangement" based upon the date and time each collocation request is "completed" less the date and time it was "submitted." NPRM, ¶ 103 & App. A, § VI.B.2. The Commission further proposes that incumbent LECs report the "Percent of Due Dates Missed with Respect to the Provision of Collocation Arrangements" based upon the percentage of orders not "completed" within the incumbent LECs "committed due date." NPRM, ¶ 103 & App. A, § VI.B.3. All three measures exclude "orders canceled by competing carrier" and would be disaggregated between physical and virtual collocation arrangements.

Ameritech concurs generally with the proposed measures as applied to physical collocation. However, Ameritech proposes several modifications and clarifications so that the measure truly addresses the performance of the incumbent LECs, and does not reflect steps and factors that are within the control of the CLEC.

First, the Commission should clarify that the date of "submission" is the date that a firm request is received by the incumbent LEC and that the date of completion is the date that the response is sent out by the incumbent LEC informing the CLEC that the incumbent has completed the collocation work. The incumbent LEC only knows the date it received the request and the date that it was sent out and should not be held responsible to find out when the request was actually sent or the response actually received. Further, the incumbent LEC cannot begin construction until it has received an actual "firm order" for the collocation arrangement which includes the initial Central Office Build Out ("COBO") payment. This can occur as long as 30 to 40 days subsequent to the CLEC providing a "submitted" order while the CLEC makes up its mind if it truly wants to place the order. The incumbent LEC should not be responsible for this delay. In addition, the clock for each measure should be re-started if the CLEC modifies its request. These changes are necessary since in many cases the incumbent LEC will need to start over or otherwise re-perform and modify work it has already started.

Second, Ameritech records only the date of receipt of a firm order and not the time. Collocation requests are processed over many weeks and not hours, and contractually required intervals for response and completion are thus expressed in days. For instance, some of Ameritech's interconnection agreements provide that it shall respond to collocation requests within ten days and that the average time to complete an installation should be 150 days. Under these circumstances, keeping track of hours and minutes would be unnecessary and unduly burdensome. For that reason, all three proposed collocation measurements should be based upon the days and should exclude reporting of hours or times of day.

Regarding virtual collocation, Ameritech agrees that virtual collocation arrangements are completely different from physical collocation, and that virtual collocation data should be disaggregated from physical collocation data.

Average Time to Respond (NPRM, ¶ 103 & App. A, § VI. B.1). Ameritech currently responds to collocation requests by providing information on space availability and costs. Ameritech believes that this response is the "response" referred to in the Appendix, but the Commission should clarify that the clock stops when the incumbent LEC sends out to the CLEC a response providing space availability and cost information and does not re-start as a part of the Average Time to Complete Measure until it has received a "firm order".

This proposed measure does not seem to and should not apply to virtual collocation because it does not provide a response in the same sense as physical collocations. Rather, provisioning of virtual collocation begins when a firm order is received. The only response that is provided is a simple acknowledgment of the receipt of the firm order. Since this acknowledgment does not delay provision of virtual collocation arrangements, measuring it here would provide little benefit to justify the costs.

Average Time to Complete (NPRM, ¶ 103 & App. A, § VI. B.2). Ameritech believes that the average time to provide a collocation arrangement should not start until the date that the incumbent LEC receives a "firm"order from the CLEC. This measure then properly holds the incumbent LEC responsible for the time it takes it to complete the installation of collocation arrangement after the CLEC has placed its order and properly excludes time that the CLEC may

spend making up its mind. Again, this measurement should exclude orders canceled by the CLEC and the clock should start over if the CLEC makes a modification to its request.

The date of completion should be the date that the incumbent LEC sends out the notice to the CLEC that the space is ready and the incumbent LEC is ready to hand over the collocation cage, since that is the date when the space is first actually available to the CLEC. The incumbent LEC should not, however, be held accountable for any CLEC delays in arranging final walk-through or accepting the space.

Percentage of Due Dates Missed (NPRM, ¶ 103 & App. A, § VI. B.3). Ameritech supports the proposal to measure "percent of due dates missed", subject to the above modifications and clarifications.

IV. REPORTING PROCEDURES

The Commission addresses potential reporting procedures to govern "(1) who should receive the reports; (2) the frequency of reports; and (3) auditing procedures." NPRM, ¶ 104. The Commission proposes that reporting procedures balance the competing objectives of providing to CLECs "sufficient information . . . so they can determine whether an incumbent LEC is complying with the nondiscrimination and just and reasonable requirements" while at the same time "minimize to the extent possible the costs and burdens associated with complying with the reporting requirements." Ameritech agrees with the Commission that reporting procedures should address who receives the reports, the frequency of reports, and audits. Further, Ameritech supports the balancing test proposed by the Commission. And, for the most part, Ameritech believes that the procedures proposed by the Commission strike the appropriate balance and should be adopted.

A. Receipt Of Reports

The Commission proposes that incumbent LECs provide reports to CLECs who are receiving service from the incumbent LEC and who request a report. Under the Commission's proposal, state regulatory agencies and the Commission can obtain a copy of the reports if they wish. NPRM, ¶¶ 106-108. Ameritech supports the Commission's proposal in these respects. In this regard, it must be remembered that the reports contain confidential data of both the CLECs and incumbent LECs and should not be distributed beyond those parties with a strict need to

know. CLECs should also be required to provide reciprocal reports in areas where they provide comparable services to incumbent LECs.

Next, the Commission asks whether a copy of all reports should be filed with a central clearinghouse "so that state commissions, other competing carriers and the general public can review an incumbent LEC's performance in different states." NPRM, ¶ 109. Ameritech opposes the use of a clearinghouse for three reasons. First, a clearinghouse is an unnecessary expense because each CLEC can receive reports for all states in which it does business and can therefore gauge an incumbent LEC's relative performance in all relevant states. Because Ameritech would report its performance relating to the receiving carrier, relating to CLECs as a whole, and relating to its retail operations, each CLEC will have the information it needs to fully judge whether it is being discriminated against in its areas of operation. Second, the report contains confidential information of the incumbent LEC and its CLEC customers and should not be publicly disclosed. Third, as needed, the Commission and state regulators can obtain copies of the reports. Thus, the Commission can directly request a copy of any report it desires to analyze or that is at issue or relevant to a complaint proceeding.

The Commission next recognizes that the reports contain information that the parties may consider confidential and asks for comment on whether incumbent LECs should only report a specific CLEC's information to the CLEC. Under the proposal, each CLEC would receive its own data along with aggregate data for all CLECs in the state. NPRM, ¶ 110. Ameritech agrees that individual CLEC data should be kept confidential and not reported to other CLECs or the public. Ameritech is strongly committed to keeping its wholesale customers' data (both raw and

aggregate carrier specific data) confidential. Raw data can be used to deduce marketing plans of other carriers, and aggregate carrier-specific data can be used to make marketing claims of apparent "superior" service.

The Commission asks (¶ 111) whether the incumbent LECs' data should be publicly disclosed. Ameritech believes that carrier and customer specific data provided in the reports is confidential and should only be disclosed to the CLECs receiving the reports and to federal and state regulators under a nondisclosure agreement. This includes the raw data that underlies the report. However, aggregate results for all wholesale and retail performance can be publicly disclosed.

B. Frequency Of Reports

Regarding the frequency of reports, the Commission asks whether the reports should be generated monthly, quarterly, or less frequently. NPRM, ¶ 112. Ameritech believes that quarterly reports strike the correct balance, provide a better overall view of trends, and help place a single month's performance into perspective. The use of monthly reports is administratively inefficient and creates the risk that isolated issues affecting one month's performance for one CLEC will be blown out of proportion and used as the basis for complaints or requests for audits to the Commission. Also, the use of quarterly reports will provide a better chance for incumbent LECs to monitor on-going progress and correct problems before reports are issued. Quarterly reports also provide more time to ascertain root causes of performance disparities before the report is released. The frequency of reporting does not really affect cost, however, because the data must be gathered on an on-going basis whether or not it is reported

monthly or quarterly. The only savings arising from the use of quarterly reports would be costs of production and distribution.

The Commission also asks (¶ 112) how long an incumbent LEC should have to prepare a report after it is requested. Ameritech believes that a forty-five day notice prior to the beginning of the reporting period (e.g.: March 15th notice for a May report) strikes a reasonable balance. This notice period allows sufficient time for the incumbent LEC to update its systems and tables with the new CLEC's system identifier.

C. Auditing Requirements

Finally, the Commission asks for comment on auditing procedures. Although the Commission recognizes that audits can be "unnecessary and burdensome", it seeks comment on what types of audits "might impose undue burdens" and on mechanisms that might "permit competing carriers to conduct audits, when necessary, while protecting the incumbent LEC from unduly burdensome or unnecessary audits." NPRM, ¶ 113. The Commission also asks who should pay for an audit.

Ameritech agrees that there is a significant risk that audits may become unduly burdensome and disruptive to the incumbent LECs' operations and should be governed by rules that limit them to cases where they are truly necessary. That is to say, the Commission and state regulatory agencies should either conduct or authorize audits in cases where there is probable cause to believe that the incumbent LEC's data contains material errors that have not been corrected even after they have been brought to the attention of the incumbent LEC. Further,

potential discrepancies that give rise to an audit should be observed over several months and not merely represent an isolated problem.

In no case should a CLEC be able to force an audit on an incumbent where it has not first addressed the issue to the incumbent LEC and given it a reasonable opportunity to investigate the claim. Incumbent LECs should be given a forty-five day period in which to investigate and respond back to the CLEC. If the problems persist after this forty-five day period, the CLEC should present the issue to the Commission or a state regulatory agency in the form of a complaint which presents evidence establishing the need for such an audit. Upon completion of a hearing of the complaint that results in a Commission or state regulatory agency authorizing an audit, an independent, duly qualified third-party auditor should be engaged to conduct the audit under a nondisclosure agreement. Selection of the auditor should be jointly agreed to by the CLEC and incumbent. Further, the CLEC should pay for the costs of the audit.

Further, even in cases where a CLEC is authorized to conduct an audit, that audit should be conducted by an independent duly qualified third-party auditor under a nondisclosure agreement because it will entail access to confidential information of the incumbent LEC and perhaps other CLECs.

The Commission asks whether the reports should include the provision of raw data for CLEC validation and further analysis of the measurements or whether they should be provided in the context of an audit and what the retention period for the raw data should be. NPRM, ¶¶ 114-115. Ameritech recommends that a retention period of eighteen months is appropriate and consistent with current operations and the provision period of raw data should be limited to audit

purposes. With the measurements properly defined, there should be no initial need for validation or further analysis. Further, access to such data could allow CLECs to improperly derive confidential business information pertaining to their competitors. Moreover, the development of a data warehouse with appropriate security arrangements to enable the provision of raw data to the CLECs would cost Ameritech over $8 million.

V. EVALUATION OF PERFORMANCE MEASUREMENTS

The Commission appropriately refrains from any attempt to establish performance benchmarks against which the measures proposed above would be evaluated. Such benchmarks are within the jurisdiction of the states, not this Commission, and have already been the subject of extensive contract negotiations and state action in arbitrations under the 1996 Act -- which are conducted at the carrier-to-carrier level and thus properly focus on the circumstances and needs of each carrier, incumbent and competitor alike. The Commission does, however, raise several issues with respect to the possible use of statistical analysis in the body of the NPRM, and also discusses certain specialized technical matters in greater depth in Appendix B. Subject to its objection that the evaluation (as well as the establishment) of performance measures is a matter for carrier specific contracts, Ameritech comments on the use of statistical methods below, and also submits, as Appendix B hereto, the White Paper of Daniel Levy, an independent expert on statistical methods.

A. Use Of Standard Statistical Techniques

The Commission first seeks comment (¶ 117) on whether it "should recommend use of a uniform evaluation process that relies on objective criteria," in the interest of consistency and predictability. And in Paragraph 1 of Appendix B, the Commission requests comments on "whether specifying a preferred statistical methodology would assist in evaluating an incumbent LEC's performance."

So far as it goes, an established set of objective statistical methods would be a useful, and efficient, first step in determining whether a LEC has achieved parity. Specifically,

Ameritech concurs that such standard measures would best be employed to establish a "Safe Harbor" as defined in Paragraph 121 of the NPRM.

Ameritech does not agree, however, that the analysis should end -- or that litigation begin -- at this elementary, objective level. If standardized statistical analysis does not, on its face, meet the established safe harbor, the reporting LEC must be allowed -- indeed, encouraged -- to perform a more sophisticated, focused investigation and analysis to determine the cause of the apparent disparity, and then take appropriate corrective action, if necessary. In other words, standard statistical methods are useful in establishing a "safe harbor," but should not preclude the LEC from using more sophisticated statistical techniques and investigation to identify the source of any possible disparity revealed by the threshold, objective analysis. Corrective action, if any, should only be taken where the second-level analysis reveals a true lack of parity. Consistency in reporting is a worthwhile goal, but slavish adherence to consistency is not.

A simple example will illustrate the need for second-level analysis, and the danger of succumbing to the seductive simplicity of a simple mathematical first-level analysis. Assume that an incumbent LEC and a CLEC each experience 100 "trouble reports" in a month, and that standard statistical analysis of performance reveals that the mean time to repair for the incumbent LEC's customers was 3.4 hours with a variance of 0.0145, while the CLEC's customers experienced a mean time of 5.0 hours with a variance of 0.0404. A simple measure of the difference in this case would reveal a difference of 1.6 hours and a t-statistic on the difference of 6.8, which is sufficiently significant to suggest possible discrimination.

A second-level analysis, however, might reveal that the time to restore service -- for CLEC and incumbent customers alike -- is always exactly 3 hours if service is disrupted during the week and is always exactly 7 hours if service is disrupted on a weekend. It might also show that 90 percent of the incumbent LEC's customers reported service disrupted on a weekday, but only half of the CLEC's customers reported a service outage on a weekday (for example, if they are heavy Internet users). Given 3 hours to restore weekday service versus 7 hours to restore weekend service, it is entirely proper for the incumbent LEC's customers to have service restored in 3.4 hours on average (3 hours multiplied by 90%, plus 7 hours multiplied by 10%), and for the CLEC's customers to have service restored in 5.0 hours on average (half in three hours, and half in seven hours). Thus, the apparent disparity in this example is entirely attributable to differences in the days on which service calls were received, not to any discrimination on the part of the incumbent.

B. Appropriate Statistical Techniques

In Paragraph 2 of Appendix B, the Commission asks what standard statistical techniques would be appropriate. The purpose of the statistical analysis proposed below is to determine whether incumbent LECs are providing the same level of service to CLEC customers that they provide to their own retail customers. As suggested by AT&T's *ex parte* filing of February 3, 1998, any given observed measure of performance represents a specific outcome of a process that contains a random component. The observed performance of an incumbent LEC on any given measure will change from one period to the next even if the underlying performance of the incumbent LEC is constant. Similarly, even though the

incumbent may be providing equal levels of service to both its own and CLEC customers, random variation and chance will result in differences between the measured service received by CLEC and incumbent LEC customers during any given measurement period.

Statistical methods can be used to distinguish between differentials in performance generated by random chance and those generated by possible disparate treatment on the part of the incumbent LECs. In addition, statistical analyses and testing protocols can be developed to determine the extent to which differences in the composition of the customer base between CLECs and incumbent LECs is responsible for apparent differences in service provided by the incumbent LECs. Although disparity may appear to exist at a highly aggregated level, a more appropriate level of disaggregation may show that parity exists.

Ameritech therefore proposes a multiple stage protocol to check for parity. In the first stage, a pre-specified set of standard statistical techniques will be used to assess parity. If this first stage analysis demonstrates parity no further analysis will be required. The statistical tests and the level of disaggregation of the performance measures used in this first stage will need to be determined prior to testing. Ameritech describes a set of specific tests for this first stage analysis below.

Because of the complexity of service that the incumbent LECs provide, it is likely that on occasion these standard tests will indicate a possible lack of parity, when in fact parity does exist. Ameritech recommends that when possible disparity is found in the first stage analysis, a second stage of analysis should be performed to determine the source of the apparent disparity. In some cases, the apparent disparity will be attributable to some factor that does not reflect

disparate service, but rather results from some acceptable market or service-based factor that was not reflected in the first stage analysis. In other cases, disparity may exist. This second stage analysis will help pinpoint the cause of disparity, allowing for efficient correction. These issues are discussed in greater detail below.

1. Use Of 95 Percent Confidence Interval

Ameritech agrees with the general framework presented by AT&T for determining disparity in the first stage of the analysis. There is a random component to the performance of the incumbent LEC that is observed on any measure. The statistical tests to determine parity must recognize this random aspect. As AT&T acknowledges, statistical tests based on a 95 percent confidence interval will falsely indicate a disparity in service in 5 percent of the cases, where parity actually exists. Put another way, in a large number of tests across multiple performance measures, 5 percent of the measures may appear to show significant departures from parity on a statistical basis even when parity actually exists.

This means that in measurement periods in which parity exists on all performance measures we would expect to observe up to five percent of performance measures exhibiting lack of parity. This raises the question of how many disparate performance measures should be observed before it is determined that there is a lack of parity in a given period. Certainly the observation of five disparate measures is too few: that will result in a finding of disparity roughly half of the time even when there is actual parity on all measures.

AT&T has suggested that in general the 95 percent confidence interval is appropriate. In this case the 95 percent confidence interval means that the test criteria should be established so

that overall parity would be rejected 5 percent of the time even when parity actually exists. For example, assume that there are 99 tests for parity in a given period (three for each of 33 performance measures). Across these 99 tests, statistical theory shows that in 5 percent of the test periods one would expect to observe more than 8 measures exhibiting an apparent lack of parity even when there is complete parity.

Obviously the number of acceptable disparate tests will depend on the number of performance measures tested. The exact number can be determined using the binomial distribution based on the number of parity tests performed in each test period. For example if 100 parity tests are performed, more than 9 percent of the tests would need to exhibit lack of parity before one could be 95 percent confident that the observed disparity was due to more than random chance. Alternatively, if 50 parity tests are performed, more than 10 percent of the tests would need to exhibit lack of parity. In both examples, the general approach remains the same: The number of performance measures allowed to exhibit lack of parity in any given test period will be set to establish a 95 percent confidence interval.

It is important to recognize that many of the tests for parity suggested in the NPRM are highly correlated to one another. This correlation results from two potential sources. First, some of the measures are based on the same underlying performance function by the incumbent LEC. For example, Average Completion Interval will be highly correlated with Percentage of Due Dates Missed. If disparity is reported on one of these measures, it is very likely that it will be reported on the other measure. Second, since a single performance measure will often be

disaggregated into multiple parity tests, it is likely that lack of parity on one disaggregated unit will be associated with lack of parity in other disaggregations.

For both of these reasons, random variations in the observed performance of the incumbent LEC may lead to multiple measures exhibiting an apparent lack of parity, resulting in a false indication of possible overall disparity. Such potential false alarms are acceptable as long as the parity tests are used as a device to trigger further investigation and to determine where potential adjustments or corrections should be made. However, if a first-level finding of disparity were an automatic trigger for enforcement action, this potential for correlation among parity tests and across performance measures directed at a single function of the incumbent LEC would have to be eliminated. This would require eliminating redundant or closely related performance measures from those suggested by the Commission.

2. Parity Tests For Specific Measures

The preceding section described the number of tests for parity that would have to be failed to establish 95 percent confidence that the incumbent LEC was not providing service in a nondiscriminatory fashion. This section discusses the statistical tests that will be used to measure observed parity on each individual performance measure.

For continuous variables (those that can assume any of an infinite variety of values, such as average completion interval), the following measures can be calculated:

(1) Z-statistic for Difference in Means = ratio of difference in means to the standard deviation of the difference.[8/] This should be a one-tailed test.

[8/] Statistical tests based on the 2-statistic are generally not recommended for samples of less than roughly 30 observations. The analysis proposed below is based on sample sizes

A value that exceeds the 95 percent confidence level should be viewed as an "extreme" value.

(2) F-statistic for Difference in Variances = ratio of the standard deviations. This should be a one-tailed test. The ratio of the sample variances will be distributed with an F-distribution if the sample variances are not significantly different. Values of this ratio outside of the critical value of the appropriate F-distribution should be viewed as "extreme" values.[9/]

For performance measures that have a binary response (i.e. only one of two possible values), only a Z-Statistic for difference in means need be calculated.

As discussed above, all possible tests should be conducted in each test period. If the total number of "extreme" values is greater than would be indicated by the 95 percent confidence interval as established by the binomial distribution, then possible discrimination may be indicated. In addition, repeated indications of disparity on a given performance measure may also indicate underlying discrimination by the incumbent LEC. Of course, random chance dictates that some performance measures will appear to be disparate in consecutive periods even when underlying parity exists. The number of performance measures that would be expected to exhibit disparity in consecutive months will depend on the number of total performance tests. The 95 percent confidence interval for the number of measures can be established using the

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of at least 30. If the Commission decides to allow tests on sample sizes less than 30, other test statistics such as a t-test should be considered.

9/ This test relies on the assumption that the underlying populations are distributed normally. Variance tests, therefore, should be limited to measures that are approximately normal.

binomial distribution, as discussed above. For example, if 100 performance measures are tested in each period we could be 95 percent sure that a lack of parity existed if 2 or more of the performance measures had "extreme" values in two consecutive months.

This set of tests would establish a threshold standard or "safe harbor," described by the FCC on page 47, paragraph 121 of its NPRM. A failure to exceed this threshold standard would result in a definitive ruling of non-discrimination. Exceeding this threshold standard should not, however, result in an automatic ruling of discrimination. Instead, an incumbent LEC which exceeds this threshold standard would be subject to more intensive analysis as described below.

3. When Sample Sizes Are Too Small

In some cases the level of disaggregation suggested above will lead to sample sizes that are too small for standard statistical tests to be valid. Although no hard rule can be applied to the sample sizes required for these statistics to be valid; many statistical texts recommend 30 observations for standard tests of means.[10/] Appendix B of these comments describes one standard test that is used to determine the required number of observations in a sample. If the required number of observations are not available for the calculation of a given mean or

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10/ The number of observations needed will depend on the nature of the test and the data tested. We use thirty observations here only because it is a generally accepted number for many common situations. A determination of the minimum required sample size will need to be determined based on the characteristics of the data. The appendix to this section describes on a commonly used method for determining the appropriate sample size.